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HEMORRHAGIC SEPTICEMIA OF DOMESTIC RABBITS  
Contagious Nasal Catarrh (Snuffles), Subcutaneous Abscesses (Boils)  
and Other Forms

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OCCURRENCE AND FORMS OF THE DISEASE

The frequency with which hemorrhagic septicemia, or pasteurellosis, which is caused by the micro-organism Pasteurella cuniculicida, or Bacterium lepisepticum, manifests itself in domestic rabbits makes it essential that rabbit breeders become familiar not only with the infection in its several forms but also with the more practicable methods of protection against, and control of, such infections in domestic rabbits. It is the purpose of this leaflet to present the more important facts that have become evident in the investigation of hemorrhagic septicemia concerning the symptoms of its different manifestations and its prevention and control.

The chronic form of the infection, known as "snuffles", and the more acute septicemic form have been recognized for several years, but recent investigations show that the infection is responsible also for such conditions as subcutaneous abscesses, or boils, and that it may exist as a chronic disease of the generative tract of adult animals and from this source occasionally produce the acute form of the disease in susceptible animals.

Once the infection gains entrance into a rabbitry, the number of animals contracting it will depend to a great extent upon their physical condition, the management practices, and the degree of sanitation maintained. If no effort is made to control the disease, about 70 percent of the animals will contract it. Although not all the ways in which it may be spread are well known, experimental evidence indicates that it is usually acquired by contact of the healthy animals with either an infected animal or its discharges.

## MANIFESTATIONS AND SYMPTOMS

Pasteurella cuniculicida is universally distributed and is usually demonstrable in most herds of domestic rabbits, especially when they are maintained in large numbers. The chronic form of the infection--contagious nasal catarrh, or snuffles--occurs most frequently. Second in frequency is that form of the infection manifesting itself in subcutaneous abscesses, or boils; third, the acute septicemic infection; and fourth, chronic infection of the internal genitalia.

### Contagious Nasal Catarrh, or Snuffles

The most pronounced symptom of the purulent nasal form of infection--rhinitis--is sneezing. There is also a thick, purulent exudate from the nose of the diseased animal that mats the hair on the inside of both forelegs. In rabbits under weaning age these symptoms may be accompanied by a similar discharge from the eyes, which frequently collects around the eyes until the lids are sealed together. Work performed by other investigators shows that although the nasal exudate may sometimes disappear, this symptom tends to recur at irregular intervals. This chronic form of the disease is more prevalent in junior and adult animals, although often entire litters show the symptoms. On autopsy, affected animals may show no other changes than an accumulation of pus in the nasal passages and sinuses.

Symptoms of sneezing and a purulent nasal discharge are produced in domestic rabbits by other forms of infection also, and it is difficult to distinguish the more acute cases of such infections by clinical examination from cases caused by Pasteurella cuniculicida. Infections due to such organisms as Alkaligenes bronchisepticus usually disappear without treatment within 10 days to 2 weeks, however, whereas the snuffles caused by P. cuniculicida may assume a more chronic form, the tip of the rabbit's nose becoming denuded of skin and a persistent scab forming. An animal so affected gradually loses flesh, and the condition terminates in death, usually from pneumonia.

### Subcutaneous Abscesses, or Boils

The only symptoms in this form of infection are swellings, or abscesses, which usually contain a thick creamy exudate that is extremely tenacious and without perceptible odor. The boils vary in size from that of a small hazelnut to that of a baseball but usually rupture before attaining a large size. In adult animals, they are found most frequently beneath the jaw and in the loose fold of the skin called the dewlap. In immature affected animals, swellings may appear on other parts of the body as well, particularly on the legs and abdomen, and on rare occasions the subcutaneous tissue over the entire back may be infiltrated with the typical exudate from which it is possible to isolate Pasteurella cuniculicida. Rabbits of all ages are often affected with swellings on the face, caused by infection from a previous nasal discharge that has become impounded in the sinuses. This form of the disease is not usu-

ally fatal, but the abscesses may continue to refill after breaking or after being opened, unless proper drainage is provided. Post-mortem examinations of affected animals usually show no other gross changes than the external swellings, although abscesses are occasionally found attached to the internal organs.

A similar condition in rabbits, known as "Schmorl's disease", is reported to be caused by a different organism, Actinomyces necrophorus. Subcutaneous abscesses from this causative factor are rare, however, as compared with those due to Pasteurella cuniculicida.

#### Acute Septicemic Form of Hemorrhagic Septicemia

The acute form of pasteurellosis is most frequently found in adult females, as the increased demand on their vitality incident to the rearing of young probably renders them more susceptible. Symptoms consist of dull eyes, rough fur, lack of appetite, and rapid, shallow breathing. Affected animals rarely live longer than 24 to 48 hours, so that many die from this form of infection before symptoms are noticed. In autopsies, the lungs usually show the most noticeable change. Because of extreme congestion they frequently assume the color and consistency of liver tissue. Autopsy also reveals severe congestion of the lining of the trachea, or windpipe, and a pronounced enlargement of the spleen. The serous surface of the intestines and the subcutaneous tissues usually show small hemorrhagic areas. As this disease often resembles other infectious diseases to which domestic rabbits are subject, positive diagnosis can be made only by bacteriological tests.

#### Infection of Genital Tract

Only adult breeding animals have been found to be affected with this form of pasteurellosis, which generally occurs only in the later stages of an epizootic of the more acute form and after the animals have been subjected to repeated exposure. It is particularly dangerous, because the condition is easily overlooked in the males and through them may become widely disseminated.

When the infection gains entrance into the genital tract of susceptible animals it produces either the acute septicemic form of the disease, with death within 48 hours, or causes a purulent discharge that usually results in the formation of abscesses.

In the male, it may be possible to detect the abscess when the testicles become affected, but when the infection is confined to other parts of the reproductive tract a purulent discharge from the urethra may be the only symptom. The abscess in the testicle may remain confined, or it may break into the abdominal cavity, producing an acute septicemia that results in death.

In the female, the vaginal discharge may be the only objective symptom. This is generally present in sufficient quantity to be recognizable, however.

Although the disease may not be fatal to the females, it generally renders them useless for further breeding and they will continue to discharge infective material for an indefinite period. At autopsy, affected females show varying amounts of the typical creamy, purulent exudate in the uterus. The horns may contain only a small amount, or the entire uterus may be abscessed. Sometimes perforated abscesses in the uterus may be responsible for the intestines and other organs becoming infected and congested, causing the abdominal organs to become adherent in one large mass.

#### PREVENTION AND CONTROL

In the prevention of disease due to Pasteurella cuniculicida, success is directly proportional to the degree of sanitation that is maintained in the rabbitry. Regular cleaning of the entire rabbitry and thorough cleaning and disinfection of every hutch before a new animal is placed in it are measures that help to reduce the incidence of all infectious diseases. Feed or water utensils should never be interchanged without first thoroughly cleaning and disinfecting them.

Systematic precaution in introducing new animals into the rabbitry is the first essential of prevention. All new animals should be isolated at some distance from the healthy stock for a period of at least 2 weeks, and no animal that shows a diseased condition should be introduced into a clean rabbitry. Breeding animals should not be handled more than is absolutely necessary, and visitors should not be permitted to pet the animals. Under no conditions should animals be permitted to come in contact with the stock feed supply. Dead animals should always be buried, burned, or otherwise disposed of, and all used bedding and nest material should be burned.

When hemorrhagic septicemia is introduced into a rabbitry, the results may be disastrous unless effective control measures are started immediately. There are various medicinal preparations and vaccines on the market that are sold as cures or protectives against this infection. Although a vaccine may raise the resistance of an animal to the infection, it does not completely protect and consequently the use of vaccine cannot be recommended. Other control methods are more effective.

It is essential that all animals showing symptoms of the disease be isolated immediately, preferably outside the main rabbitry. If conditions prevent this, one part of the premises should be set aside for quarantine of the diseased stock. The attendant should protect his clothes with an apron or coat while handling sick animals and should wash his hands thoroughly afterward.

In rabbitries in which only a few animals are affected it is advisable to remove by slaughter the infected individuals. Rabbitries in

which a large percentage of the stock is infected may advantageously be divided into two units, noninfected and diseased. If effective quarantine is maintained between the two groups, a sufficient number of healthy breeding animals may be developed to supply the requirements of the establishment and to permit disposal of all animals showing symptoms.

The use of medicinal preparations to cure contagious nasal catarrh (snuffles) is not advisable. Most preparations sold for this purpose will dry up the nasal secretions for a time, but the condition usually recurs. It is better to practice prevention by maintaining the animals in good physical condition. As the vitamins present in green, leafy feeds are very beneficial in protecting against respiratory infections, fresh greens in moderate quantity should constitute a part of the daily ration. When such feed is not available, the use of a good grade of cod-liver oil must be relied upon, but it should not be mixed in more feed than can be used within a day or two, as it soon loses its protective qualities when exposed to the air.

Animals affected with subcutaneous abscesses (boils) can usually be restored to usefulness if given extra attention. An abscess should not be permitted to break, as such a condition serves to spread the infection, but should be cared for as soon as found. The hair should be clipped away and the abscess lanced with a sharp knife at its lowest point. All the contents should be expressed and the interior then swabbed with tincture of iodine applied with a small piece of absorbent cotton on a wooden applicator. Precaution must be exercised to collect every bit of exudate from an abscess on a piece of paper or cloth so that it may be burned or buried, in order to prevent further spread of the disease. The incision must be sufficiently large to permit thorough cleaning of the interior, which should be done every day for several days to prevent the wound from healing over and the abscess from refilling. When an abscess is located within a bony structure, such as the head, it requires a special operative procedure, and the animal should be destroyed unless particularly valuable.

Treatment of animals suffering from the acute septicemic form of hemorrhagic septicemia is of little benefit, as the animals usually die within 24 hours. Inasmuch as they may die before it is known that they are affected, it is advisable to regard the animals in adjoining hutches as exposed and keep them under close observation for a period of 10 days to 2 weeks.

Animals found affected with a cuniculicida infection of the generative organs should be disposed of as soon as possible. The relatively few that recover usually will not reproduce so that they are of no further use as breeders and serve only as potential spreaders of the disease.

